

Serial No. 09/936,173  
Amendment dated 28 November 2006  
Reply to Advisory Action mailed 26 September 2006  
and to Office Action mailed 12 April 2006

*REMARKS*

Claims 4, 8, 10, and 14-25 have been amended to be consistent with amended claim 31 and to make the language of the claim clearer.

Claim 5 has been amended to include the language of claim 6 and to make the language of the claim clearer.

Claim 6 has then been canceled.

Claim 7 has been amended to be consistent with amended claim 5 make the language of the claim clearer.

Claim 11 has been amended to make the language of the claim clearer.

Claim 13 has been amended to be consistent with amended claim 11 and to make the language of the claim clearer.

Claim 28 has been amended to return to the range found on page 7, lines 23-24 of the specification.

Claim 31 has been amended to make the language for (2,4-dichlorophenoxy) acetic acid consistent with the language found in the specification and to insert abbreviations for plant growth regulators as used in the specification in order to make the language of the claims clearer. Claim 31 has also been amended in step (b) by adding additional plant hormones, specifically (1) a mixture of 2,4-D and kinetin and (2) a mixture of 2iP and NAA. Support for these additions can be found at page 11, lines 3-10 and in the Examples. Claim 31 has further been amended in step (c) to indicate that the DNA is a "first" DNA to be consistent with claim 36. In addition, claim 31 has been amended to specify that the transformed callus is cultured to induce somatic embryos and development of plantlets from the somatic embryos. Support for this language can be found in the Examples, for example, in Example 3, at page 15, line 28 - page 16, line 1. Finally, claim 31 has been amended to specify that the plantlets are rooted to produce the transgenic cotton plants. Support for this language can be found at page 16, lines 1-3.

Serial No. 09/936,173  
Amendment dated 28 November 2006  
Reply to Advisory Action mailed 26 September 2006  
and to Office Action mailed 12 April 2006

Claim 32 has been amended to include the language of claims 33-35.

Claims 33-35 have then been canceled.

Claim 36 has been amended to be consistent with amended claim 31 and to make the language of the claim clearer.

New claim 37 has been added to claim a species of cotton plants. Support for claim 37 is found, for example, at table 1 of the specification.

New claim 38 has been added to specify the amount of nitrate as supported at page 7, lines 24-25 of the specification.

New claim 39 has been added to specify the nitrate as  $\text{KNO}_3$  as in claim 30.

It is submitted that these amendments do not constitute new matter, and their entry is requested.

**Rejection under 35 U.S.C. 112 first paragraph.**

Claims 4-8, 10, 11, 13-26, 28 and 30-36 stand rejected under 35 U.S.C. 112, first paragraph for failure to comply with the enablement requirement. The Examiner asserts that the specification does not enable the broad scope of the claimed subject matter. Applicants traverse this rejection.

Specifically, Applicants assert that the teachings of the instant application would instruct one of ordinary skill in the art how to transform different varieties of cotton using different vectors and different marker genes. How a teaching is set forth, by specific example or broad terminology, is not important. *See, In re Marzocchi*, 439 F.2d 220, 223-24 169 USPQ 367, 370 (CCPA 1971). Thus, the claims need not recite such factors where one of ordinary skill in the art to whom the specification and claims are directed would consider them obvious.

Applicants note that the prior art clearly demonstrates that different varieties of cotton could be regenerated and transformed as of the effective filing date of the present application. Thus, although in the early days of cotton regeneration and transformation, the Coker varieties of cotton

Serial No. 09/936,173  
Amendment dated 28 November 2006  
Reply to Advisory Action mailed 26 September 2006  
and to Office Action mailed 12 April 2006

were the ones that were able to be successfully regenerated and transformed, other varieties of cotton could be successfully regenerated and transformed at the effective filing date of the present invention. Similarly, the prior art clearly demonstrates that different strains of *Agrobacterium tumefaciens* could be used to transform cotton as of the filing date of the present application. Thus, although in the early days of cotton transformation, *Agrobacterium tumefaciens* LBA4404 was the strain used for cotton transformation, other strains were used for cotton transformation at the effective filing date of the present invention. To demonstrate the wider applicability of transformation to different cotton varieties and using different strains of *Agrobacterium tumefaciens*, Applicants provide copies of the following representative materials. Hansen et al. ("Constitutive expression of the virulence genes improves the efficiency of plant transformation by *Agrobacterium*," *Proc Natl Acad Sci USA* **91**:7603-7607, 1994) shows the transformation of *Gossypium hirsutum* L. cv Deltapine 50 with three strains of *Agrobacterium tumefaciens* C58, Ach5 and LBA4404. Cousins et al. ("Transformation of Australian cotton cultivar: prospects for cotton improvement through genetic engineering," *Australian Journal of Plant Physiology* **18**:481-494, 1991 (Abstract)) shows the transformation of Australian cultivar Siokra 1-3. Gould et al. ("Adaptation of cotton shoot apex culture to *Agrobacterium*-mediated transformation," *Plant Mol Biol Rept* **16**:1-10, 1998) shows the transformation of "any desired variety of cotton" using *Agrobacterium tumefaciens* strains EHA101, EHA105 or other super virulent strain. Yenofsky et al. (US 6,710,228 B1) shows the transformation of cotton line B1654 and discloses that other upland or Pima cotton varieties could be used. These references, reflecting the state of the art at the time of the present invention, demonstrate the broader applicability of cotton transformation than that asserted by the Examiner. These references, demonstrate that a skilled artisan would expect and accept Applicants' statement

It is believed that the present method has broad applicability to transformation of cotton varieties, as it overcomes or minimizes several of the problems associated with previous work relating to cotton transformation (such as

Serial No. 09/936,173  
Amendment dated 28 November 2006  
Reply to Advisory Action mailed 26 September 2006  
and to Office Action mailed 12 April 2006

breakthrough of non-transformed callus, poor explant growth and low transformation rate, poor somatic regeneration) through the use of fibrous root explants.

to be true with reasonable predictability.

In further support of Applicants' position that claim subject matter is enabled for broad applicability, Applicants submit herewith a Declaration Under 37 C.F.R. 1.132 by Dr. Yan Hong. Dr. Hong describes additional experiments that were performed by the inventors or under their supervision using the techniques described in the present application. The experiments involved the transformation of cotton variety Coker 312 with a different *Agrobacterium tumefaciens* strain and different vector. Specifically, the examples show successful transformation of cotton lines using *Agrobacterium tumefaciens* strain AGL1 with a vector containing green fluorescent protein (GFP) and NPTII as markers. One of ordinary skill in the art would readily appreciate the interchangeability of the luciferase marker gene as exemplified in the present application for the GFP marker gene utilized in the experiments set forth in the Rule 132 Declaration. Similarly, one of ordinary skill in the art would readily appreciate the interchangeability of the *Agrobacterium tumefaciens* strain LBA4404 for the *Agrobacterium tumefaciens* strain AGL1 utilized in the experiments set forth in the Rule 132 Declaration. As described in the Rule 132 Declaration, 15 transgenic cotton lines were produced in accordance with the claimed subject matter using a different *Agrobacterium tumefaciens* strain and two different selectable agents or markers. These experiments clearly demonstrate that the claimed subject matter is enabled for other *Agrobacterium tumefaciens* strains and other selectable agents and markers.

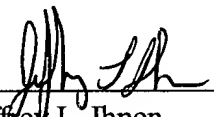
In view of the above amendments and remarks, Applicants submit that the specification fully enables the full scope of the claimed subject matter. Withdrawal of this rejection is requested.

In view of the above amendments and remarks, Applicants believe that the present claims satisfy the provisions of the patent statutes and are patentable over the cited prior art.

Serial No. 09/936,173  
Amendment dated 28 November 2006  
Reply to Advisory Action mailed 26 September 2006  
and to Office Action mailed 12 April 2006

Reconsideration of the application and early notice of allowance are requested. The Examiner is invited to telephone the undersigned to expedite the prosecution of the application.

Respectfully submitted,

By   
Jeffrey L. Ihnen  
Attorney for Applicants  
Registration No. 28,957  
ROTHWELL, FIGG, ERNST & MANBECK, p.c.  
Suite 800, 1425 K Street, N.W.  
Washington, D.C. 20005  
Telephone: (202) 783 6040

**ATTACHMENTS:** Hansen et al. ("Constitutive expression of the virulence genes improves the efficiency of plant transformation by *Agrobacterium*," *Proc Natl Acad Sci USA* 91:7603-7607, 1994)  
Cousins et al. ("Transformation of Australian cotton cultivar: prospects for cotton improvement through genetic engineering," *Functional Plant Biol* 18:481-494, 1991 (Abstract))  
Gould et al. ("Adaptation of cotton shoot apex culture to *Agrobacterium*-mediated transformation," *Plant Mol Biol Rept* 16:1-19, 1998)  
Yenofsky et al. (US 6,710,228 B1)  
Declaration Under 37 C.F.R. 1.132 of Dr. Yan Hong

#1362291v1<RFDMS> -2577-107.Amendment 6